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Photo shows water spraying device to prevent coal dust explosion
that has been installed near the loading bin of a coal conveyor.

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炭塵爆発を防ぐため送炭コンベアの装車処にもうけられている霧吹き装置。大同炭鉱雁崖坑の装置である。

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SPEED UP IN CONSTRUCTION OF COAL MINES AND IMPROVEMENT IN COAL
QUALITY

There is very little information regarding the news on coal industry of Communist China. The actual production figure has not been announced since 1959 which gave the figure of 347,800,000 tons. An overall detail report on Chinese coal industry is difficult to grasp but the fragmentary reports show that China is making a steady progress.

Construction Time of Coal Mines Reduced by About a Year

The following shows the annual production of new mines developed during 1963 and 1964.

Ch'ing-he-men shaft, Fou-hsin Coal Mine, Liaoning (600,000 tons)

Chang-hsin shaft, Chi-hsi Coal Mine, Heilungkiang (600,000 tons)

New shaft at Wen-he Coal Mine, Kirin (370,000 tons)

Pa-tae-chiang shaft, T'ung-hua Mining Affairs Bureau, Kirin (450,000 tons)

Chin-hua-shan shaft, T'ung-ch'uan Mining Affairs Bureau, Shensi
(450,000 tons)

Fan-ke-chuang shaft, K'ai-lo Coal Mine, Hsueh (1,800,000 tons)

Wu-yang shaft, Lu-an Coal Mine, Shansi (900,000 tons)

Chin-ch'eng-wang-t'ai-p'u shaft, Ch'in-shui Coal Field, Shansi
(450,000 tons)

Incline shaft, Ta-t'ung Yung-ting-chuang Coal Mine, Shansi (1,500,000 tons)

Shaft, Hsuan-lo Mining Affairs Bureau, Henan (300,000 tons)

No.10 shaft, P'ing-ting-shan Coal Mine, Henan (1,200,000 tons)

Shaft, Ho-pi Ta-hu Coal Mine, Henan (750,000 tons)

Shaft, Shao-wu Coal Mine, Fukien (210,000 tons)

Yang-ch'ang Coal Mine, Yunnan (being constructed)

Over 10 new mines began operating during 1963 and 1964, but the most significant developments are the use of modern mining construction techniques and the shortening of construction time. The NCMA report from T'ai-yuan of 16 June stated that the construction time through use of modern techniques has been reduced by about a year compared to the time required prior to 1963. In general, a large scale mine requires four years (previously 5 years) and a medium size mine requires two years (previously over three years) to build. It is said that 16 new shafts scheduled to be built by 1966 will be put into operation during 1965.

Needless to say, the economic effect derived from the shortened construction time is great. The Ministry of Coal Industry of Communist China calculates that if a construction of a mine is reduced by a year a coal mine with an annual production of 900,000 tons will save an investment of 2,000,000 yuan, cut down 300,000 working days and will have an additional coal of 500,000 tons.

Construction Method Developed at Ching-hsi Coal Mine in Peiping

A new method was first applied during the construction of Hsi-shan-shui shaft at the Ching-hsi Coal Mine in Peiping. In June 1963, the State Planning Commission and the State Economic Commission carried out a systematic work at the mine with the mine construction workers of the seven industries

including coal mining, metallurgy, construction and railroads and decided to popularize the method. This new method became nationally known as the "faster, better and wasteless" method of constructing mines.

This mine shaft construction method utilizes experiences used in 16 operations for construction of shaft and high speed digging and is referred to as a "wet rock cutting, high speed digging and speedy shaft building" method. The method in general is as follows. About 7 or 8 air drills operate simultaneously on wall surfaces and a whole section is blasted at one blast. These air drills are equipped with legs and water nozzles. The legs support the weight of the drill which can be operated by one man. In the past, each drill required three men to operate. Water ejects when the drill is in operation. The water absorbs the rock powder which keeps the air clean and prevents the powder from flying around. Normally, six different processes are involved but the new method accomplishes these in one operation. In the case of Ching-hsi Coal Mine, the tempo of construction just about doubled and the cost per meter was reduced by 200 yuan (about 30,000 yen). During the three years of drilling operation, not one silicosis patient appeared.

Digging 300 Meters in One Month

The speed of shaft construction at various coal mines increased since the new method was adopted two years ago. Prior to 1963, there were only six corps in the entire China which were able to dig over 100 meters through rocks, but as of April 1965, there are 162 corps capable of digging through

100 to over 200 meters in one month. The two Ch'en-chia-fen corps dispatched by Ching-hsi Coal Mine to assist in the construction of Ta-t'ung Coal Mine established a record of 351.1 meters during the month of May. This new construction method not only speed up the progress but improves the quality of work. Recently the Ministry of Coal Industry inspected the 179,000 meters of newly developed rock shafts and testified that all meet the national standard specifications.

Furthermore, this construction method can be applied also in iron ores, non-ferrous metals, lime stone, asbestos, graphite and mica mines. It can also be used in railroad tunnels, basic work on large dams, sewage systems and subway systems. It is said that 29 digging crews of K'eng-tae Tsung Kung-sau of the Ministry of Metallurgical Industry speeded up the operation by 15- 50% during January to May 1965.

Improvement of Coal at Ta-t'ung Coal Mine

An effort to improve the quality of coals has been noted in line with the technical progress made in the basic construction of mines. A noteworthy example is the Ta-t'ung Coal Mine in Shansi Province.

The Ta-t'ung Coal Mine located near the northern border of Shansi Province is a representative coal mine of China with a total area of 2200 km² and a reserve of over 40,000,000,000 tons. It serves as a base for motive power of Pao-t'ou Steel Combine and T'ai-yuan heavy industry region and supplies coals to 23 provinces and cities. There are over 2300 industrial production units using coals from Ta-t'ung. Refuse rate of Ta-t'ung coal being transported out daily is less than 0.5% and the ash

content does not exceed 10%. No effort ^{was} made in improving the quality of the Ta-t'ung coal because of its superior grade.

However, the sales department of the Mining Affairs Bureau of the Ta-t'ung Mine despatched an investigation team to various consumers to seek out the views of these consumers of the coal. A thorough check at Anshan Steel Company and the Ta-lien Port Authority showed defects of the coal which have not been detected before. For example, the Anshan Steel's power plant and coal gas furnace utilize uniform size coal; therefore, large clumps and small size coal from Ta-t'ung ^{were} either broken up or shifted before being used. The cadres at the plant stated that a daily manpower of 180 ^{is} required just to sort the coals. The Ta-lien Port Authority had similar problems. The investigation team calculated that the purchasing and transporting cost of coals to Anshan Steel alone amounted to 10,000 yuan each month.

When the above became known, the cadres of Mining Affairs Bureau appealed to all workers to improve the quality.

First of all, they studied the problem of varying size and found that many of the coal dressing facilities were too crude. Through technical reform, coal dressing was improved and the operation method was also improved.

The workers' sense of responsibility strengthened when they became aware of the important significance in quality improvement. Miners at Chin-hua-kung and K'ung-chin-wan mine shafts which produce relatively

good quality coal are carrying out the work of trying to eliminate all refuse. Any member finding refuse in coal trucks for delivery will stop delivery. These workers are saying that it is better to spend more time at the mine than to cause inconvenience to the consumers.

Recently, several mine shafts had coal seam shifted which caused higher content of ashes and refuse. A research was conducted. A method of drilling many holes and using less explosives to prevent breaking of rocks was used. In this manner, coal can be taken out and the rocks can be removed separately.

An inspection method has been improved. Coal being transported must pass through six teams of inspections. Coals are not released until the National specifications are met.

Since the above measures have been taken, the coals at Ta-t'ung Mine have reduced the average ash content to 8.68% and the refuse rate to 0.3%.

Quality and Quantity Problems Resolved at Coal Dressing Plant at Pen-hsi Ts'ai-t'un Coal Mine

The Pen-hsi Ts'ai-t'un Coal Mine in Liaoning Province achieved great ~~great~~ result in the reduction of ash content and also increased the production of "clean" coal. This clean coal is a heavy coking coal being supplied to Anshan Steel Company and to Pen-hsi Steel Company.

However, a loss of clean coal was inevitable in the process of lowering the ash content. The Coal Dressing Plant calculates that for each

percent reduction of ash content an eight to ten percent loss of clean coal is inevitable and this was considered a "general rule." However, the State requested that the ash content be reduced further from 12.5% of 1964 to 11.5%, which according to the "general rule", a broader reduction of clean coal recovery must be expected. In other words, a recovery rate of 88.4% attained in 1964 would be lowered to 55.3%. The higher echelon realized this. The quality of coal would surely improve but must expect a loss of 140,000 tons of clean coal.

It was decided to resolve the problem of quality or volume. It was discovered that as the quality of coal improved the ratio of slurry almost doubled which means that a large quantity of clean coal became mixed with slurry. Therefore, recovery of clean coal from slurry would improve the recovery rate. When this became known, a new method of flotation system was experimented. It was discovered that a repetition of three flotation cleaning instead of one made possible to recover over 20 tons of clean coal from slurry a day. This improved the recovery rate by 3%. It was also discovered that defective facilities affected the quality and volume of coal. A complete investigation was made and over 200 defects were corrected.

Thus, the contradiction of "improving quality and losing quantity" was resolved. Coals transported to user during April to June of 1965 had less ash content than the State called for. During the same period, the recovery of 18,200 tons of clean coal was greater than anticipated

and the ash content was 0.2% less than the plan called for. The rate of recovery was 10% greater than the plan.

Record of Digging 2.456 Ton Per Day Per Man

During the first quarter of 1965, the Shih-ke-chieh Coal Mine in Shansi Province produced an average of 1.876 ton per man per day, but the daily average was raised to 2.456 tons in April and has been maintaining top level nationally since. This amazing record was obtained through analytical comparison of production process and improve the area where improvement was needed. Technical reforms in 21 items including automatic taxiing system and mechanization of car pusher were made and 180 men formerly engaged in these work have been transferred to other types of work.